

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – SUMMER • 2014****Subject Code: 171705****Date: 31-05-2014****Subject Name: Instrumentation for Bio-medical Applications****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks

- Q.1** (a) Explain heart circulatory system with relevant diagram. **07**
(b) “Body as a control system”. Justify the statement. Draw block diagram of biomedical measurement system. **07**
- Q.2** (a) Enlist various systems of human body. Explain GI (Gastrointestinal) system in detail. **07**
(b) What are the ideal characteristics of bio-electric amplifier? Explain any one of them with its circuit diagram. **07**
- OR**
- (b) What is biopotential? Explain different types of bio-electrodes in detail. **07**
- Q.3** (a) Draw the basic block diagram of ECG machine. Enlist various artifacts related to ECG along with its sources. **07**
(b) Explain the different categories of measurement and discuss the importance of SNR (Signal to Noise ratio) in biomedical measurement. **07**
- OR**
- Q.3** (a) What is the significance of blood flow meter? Explain any one in detail. **07**
(b) What is the importance of measurement of Blood pressure in the diagnosis of cardiovascular disease? Enlist various techniques to measure Blood Pressure. Explain any one of them **07**
- Q.4** (a) What are the basic functions of kidney? Explain the components of haemodialysis machine with neat block diagram. **07**
(b) Write a short note on: **07**
i) Spirometer
ii) Defibrillator
- OR**
- Q.4** (a) Explain the structure and function of central nervous system. **07**
(b) What is pacemaker? Enlist different types of artificial pacemaker. Explain any one of them in detail. **07**
- Q.5** (a) Give the names of medical laboratory instruments. Explain any one in detail. **07**
(b) Discuss the architecture of operation theater. Enlist various instruments available in it. **07**
- OR**
- Q.5** (a) Discuss the properties of medical ultrasound. Explain different modes of ultrasound scan. **07**
(b) Explain block diagram of EEG machine. Discuss EEG electrodes and 10-20 system. **07**
